

We claim:

1. An isolated and/or purified nucleic acid sequence which encodes for a protein having lycopene ϵ -cyclase enzyme activity and has an amino acid sequence which is at least 85% identical to one of SEQ ID NOS: 23 or 25-27.

5 2. The nucleic acid sequence of claim 1, wherein the protein has the amino acid sequence of one of SEQ ID NOS: 23 or 25-27.

3. A vector comprising the nucleic acid sequence of claim 1, wherein the nucleic acid sequence is operably linked to a promoter.

4. A host cell which contains the vector of claim 3.

5. The host cell of claim 4, wherein the host cell is selected from the group consisting of a bacterial cell, an algal cell, a yeast cell and a plant cell.

6. The host cell of claim 4, wherein the host cell is a photosynthetic cell.

7. An isolated and/or purified protein having lycopene ϵ -cyclase enzyme activity and having an amino acid sequence which is at least 85% identical to one of SEQ ID NOS: 23 or 25-27.

8. The protein of claim 7, wherein the protein has the amino acid sequence of one of SEQ ID NOS: 23 or 25-27.

AMENDED CLAIMS

[received by the International Bureau on 15 November 1999 (15.11.99);
original claims 1,2,7 and 8 amended; remaining claims unchanged (1 page)]

1. An isolated and/or purified nucleic acid sequence which encodes for a protein having lycopene ϵ -cyclase enzyme activity and has an amino acid sequence which is at least 85% identical to one of SEQ ID NOS: 23, 25 or 26.

5 2. The nucleic acid sequence of claim 1, wherein the protein has the amino acid sequence of one of SEQ ID NOS: 23, 25 or 26.

3. A vector comprising the nucleic acid sequence of claim 1, wherein the nucleic acid sequence is operably linked to a promoter.

4. A host cell which contains the vector of claim 3.

10 5. The host cell of claim 4, wherein the host cell is selected from the group consisting of a bacterial cell, an algal cell, a yeast cell and a plant cell.

6. The host cell of claim 4, wherein the host cell is a photosynthetic cell.

15 7. An isolated and/or purified protein having lycopene ϵ -cyclase enzyme activity and having an amino acid sequence which is at least 85% identical to one of SEQ ID NOS: 23, 25 or 26.

8. The protein of claim 7, wherein the protein has the amino acid sequence of one of SEQ ID NOS: 23, 25 or 26.